



CERTIFICATE OF ACCREDITATION

This is to attest

INSTITUTE FOR THE DEVELOPMENT AND QUALITY, MACAU

INSTITUTO PARA O DESENVOLVIMENTO E QUALIDADE, MACAU, AVENIDA PADRE TOMÁS
PEREIRA, S.N.,
TAIPA, MACAU, GUA 999078, CHINA

Testing Laboratory TL-781

has met the requirements of AC89, *IAS Accreditation Criteria for Testing Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories*. This organization is accredited to provide the services specified in the scope of accreditation.

Effective Date February 20, 2025



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Accredited to ISO/IEC 17025:2017

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Air Cleanliness of Cleanroom	
ISO 14644-1 2015	International standard for cleanrooms and associated controlled environments - part1: Classification of air cleanliness by particle concentration
Air Pollutant Sampling and Analysis	
GB/T 14678-1993	Air quality — Determination of sulfuretted hydrogen, methyl sulfhydryl, dimethyl sulfide and dimethyl disulfide — Gas chromatography 4.2.2 Gas Sampling Bag Equipment 5.2 Gas Sampling Bag
GB/T 16157-1996/XG1-2017	Determination of particulates and sampling methods of gaseous pollutants emitted from exhaust gas of stationary source
HJ 534-2009	Ambient air — Determination of ammonia — Sodium hypochlorite-salicylic acid spectrophotometry 6.2 Sampling part
HJ 1263-2022	Ambient air—Determination of total suspended particle —Gravimetric method
Chemical Oxygen Demand	
APHA 5220 D 24 th Edition 2023	Standard methods for the examination of water and wastewater, CHEMICAL OXYGEN DEMAND (COD) - Closed Reflux, Colorimetric Method
HACH Method 8000	Method 8000 Oxygen Demand, Chemical USEPA Reactor Digestion Method
Cleanliness Verification of Air Duct	
ACR 2021	ACR, The NADCA Standard for Assessment, Cleaning & Restoration of HVAC Systems--2021 edition
Fire	
BS 476-4:1970	Fire tests on building materials and structures — Part 4: Non-combustibility test for materials
BS 476-20:1987	Fire tests on building materials and structures – Part 20: Method for determination of the fire resistance of elements of construction (general principles)

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BS 476-22:1987	Fire tests on building materials and structures – Part 22: Methods for determination of the fire resistance of non-loadbearing elements of construction
BS EN 1363-1: 2020	Fire resistance tests – Part 1: General requirements
BS EN 1364-1: 2015	Fire resistance tests for non-loadbearing elements – Part 1: Walls
BS EN 1366-3: 2021	Fire resistance tests for service installations – Part 3: Penetration seals
BS EN 1366-4: 2021	Fire resistance tests for service installations – Part 4: Linear joint seals
BS EN 1634-1: 2014 + A1: 2018	Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware -Part 1: Fire resistance test for door and shutter assemblies and openable windows
BS EN 13501-2: 2016	Fire classification of construction products and building elements – Part 2: Classification using data from fire resistance tests, excluding ventilation services
Gas Vapor Recovery System	
Regulamento Administrativo n.º 10/2018 Aprova o Regulamento de construção e exploração de postos de abastecimento de combustíveis –	ANEXO IV, Parte I — Teste de estanquidade de vapores do sistema de recuperação de vapores nos postos de abastecimento ANEXO IV, Parte II — Teste da razão volumétrica ar para líquido do sistema de recuperação de vapores nos postos de abastecimento ANEXO IV, Parte III — Teste de resistência hidráulica do tubo de recuperação de vapores nos postos de abastecimento
(Translation: Administrative Regulation No. 10/2018 Approval for the Regulation for the Construction and Operation of Fuel Filling Stations -	Appendix IV, Part I Vapor Tightness Test of Vapor Recovery System at Filling Stations Appendix IV, Part II Air to Liquid Volume Ratio Test of Vapor Recovery System at Filling Stations Appendix IV, Part III Hydraulic Resistance Test of Vapor Recovery Pipe at Filling Stations)
GB 20952-2020	Emission standard of air pollutant for gasoline filling stations – Appendix A “Dynamic Back Pressure Test” Appendix B “Vapor Recovery System Tightness Test” Appendix C “Air to Liquid Volume Ratio Test”
TP-201.3	California Environmental Protection Agency Air Resource Board Vapor Recovery Test Procedure TP-201.3 “Determination of 2 Inch WC Static Pressure Performance of Vapor Recovery Systems of Dispensing Facilities”
TP-201.5	California Environmental Protection Agency Air Resource Board Vapor Recovery Test Procedure TP-201.5 “Air to Liquid Volume Ratio”
Illuminance and Luminance	

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Diretrizes para os Projetos de Iluminação Pública de Macau –	Capítulo 4 – clausula 4.4.3.3 Capítulo 8 – clausula 8.7 Apêndice – Tabela 1, Tabela 2, Tabela 7 and Tabela 10
(Translation: Guidelines for Macao Public Lighting Projects	Chapter 4 - clause 4.4.3.3 Chapter 8 - clause 8.7 Appendix – Table 1, Table 2, Table 7 and Table 10)
DB31/T 708-2013	Limits and measure methods of maximum visible brightness for public places light emitting diode (LED) panels
GB 50034-2013	Standard for lighting design of buildings – Chapter 5
GB/T 5700-2008	Measurement methods for lighting
Indoor Air Formaldehyde Test	
GB/T 16129-1995	Standard method for hygienic examination of formaldehyde in air of residential areas - Spectrophotometric method
Microorganism	
APHA 9213B 6b 24 th edition, 2023	Standard Methods for The Examination of Water and Wastewater, Tests for Staphylococci or <i>Staphylococcus aureus</i>
APHA 9215 24 th edition 2023	Standard Methods for The Examination of Water and Wastewater, Heterotrophic Plate Count
APHA 9221 24 th edition 2023	Standard Methods for The Examination of Water and Wastewater, Multiple-Tube Fermentation Technique – Total Coliform, Thermotolerant (Fecal) Coliform, <i>Escherichia coli</i>
APHA 9222 24 th edition 2023	Standard Methods for The Examination of Water and Wastewater, Membrane Filter Technique for Members of the Coliform Group – Total Coliform, Thermotolerant (Fecal) Coliform, <i>Escherichia coli</i>
APHA 9223 24 th edition 2023	Standard Methods for The Examination of Water and Wastewater, Enzyme Substrate Coliform Test – Total Coliform, Thermotolerant (Fecal) Coliform, <i>Escherichia coli</i>
ASTM D8429-21	Standard Test Method for Legionella pneumophila in Water Samples Using Legiolert
GBT 5750.12-2023	Standard examination methods for drinking water -- Microbiological parameters Pour Plate Method – Standard Plate Count Membrane Filtration – Total Coliform, Thermotolerant Coliform, <i>Escherichia coli</i> Multiple-tube Fermentation – Total Coliform, Thermotolerant Coliform, <i>Escherichia coli</i> Enzyme Substrate Method – Total Coliform, <i>Escherichia coli</i>
GB/T 18204.3-2013	Examination methods for public places -- Part 3: Airborne microorganism Impact Method – Total Bacterial Count, Total Fungi Count

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GB/T 18204.4-2013	Examination methods for public places—Part 4: Microorganism on a surface of public articles Plate Count Method – Total Bacterial Count, Total Fungal Count Multiple-tube Fermentation Method –Coliforms Plate Identification Method – Staphylococcus aureus
GB/T 18883-2022	Standards for Indoor air quality Appendix G – determination of Total Bacterial Count
A Guide on Indoor Air Quality Certification Scheme for Offices and Public Places (2019)	ANNEX 4 (h) Airborne Bacteria
HJ 347.1-2018	Water quality - Determination of fecal coliform - Membrane filtration
HJ 347.2-2018	Water quality - Determination of fecal coliform - Manifold zymotechnics
HJ 1001-2018	Water quality - Determination of total coliforms, fecal coliforms and Escherichia coli - Enzyme substrate method
ISO 16266:2006	Water quality - Detection and enumeration of Pseudomonas aeruginosa – Method by membrane filtration
JIS Z 2801:2010 (AMENDMENT 1:2012)	Antibacterial products – Test for antibacterial activity and efficacy and Amendment 1
Standard methods for examination of water and wastewater of China, version 4	Pour Plate Method – Total Bacterial Count Membrane Filtration – Total Coliform, Thermotolerant Coliform Multiple-tube Fermentation – Total Coliform, Thermotolerant Coliform
Noise	
Despacho do Chefe do Executivo n.º 96/2020 ANEXO Norma sobre Acústica, Macau –	ANEXO - Norma sobre Acústica
(Translation: Dispatch of the Chief Executive No. 96/2020 ANNEX Acoustic Standard, Macao –	ANNEX - Standard on Acoustics)
Decreto-Lei n.º 34/93/M, Macau -	Capítulo 3, artigo 8 Capítulo 4, artigo 12 Capítulo 5, artigo 14 ANEXO 1, ANEXO 2 & ANEXO 3
(Translation: Law No. 34/93/M, Macao –	Chapter 3, article 8 Chapter 4, article 12

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	Chapter 5, article 14 Annex 1, Annex 2 & Annex 3)
GB 3096-2008	Environmental quality standard for noise
GB/T 3449-2011	Acoustics-Measurement of noise inside railbound vehicles
GB 14892-2006	Noise limit and measurement for train of urban rail transit
ISO 3381: 2021	Railway applications — Acoustics — Noise Measurement inside railbound vehicles
Noise Insulation	
ASTM E336	Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings
ASTM E413	Classification for Rating Sound Insulation
ASTM E989	Standard Classification for Determination of Single-Number Metrics for Impact Noise
ASTM E1007	Standard Test Method for Field Measurement of Tapping Machine Impact Sound Transmission through Floor-Ceiling Assemblies and Associated Support Structures
GB/T 19889.3-2005	Acoustics-Measurement of sound insulation in buildings and of building elements-Part 3: Laboratory measurements of airborne sound insulation of building elements
GB/T 19889.4-2005	Acoustics—Measurements of sound insulation in buildings and of building elements—Part 4: Field measurements of airborne sound insulation between rooms
GB/T 19889.6-2005	Acoustics-Measurement of sound insulation in buildings and of building elements-Part 6: Laboratory measurements of impact sound insulation of floors
GB/T 19889.7-2022	Acoustics—Measurement of sound insulation in buildings and of building elements—Part 7: Field measurement of impact sound insulation
GB/T 50121-2005	Rating standard of sound insulation in buildings
Oil and Grease Testing	
HJ 637-2018	Water quality - Determination of petroleum, animal fats and vegetable oils - Infrared spectrophotometry
Oil Fume and Oil Mist	
HJ 1077-2019	Stationary source emission—Determination of oil fume and oil mist—Infrared spectrophotometric method
Ozone	

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HJ 504-2009/XG1-2018	Ambient air - Determination of ozone- indigo disulphonate spectrophotometry
HJ 590-2010/XG1-2018	Ambient Air --- Determination of Ozone ---- Ultraviolet photometric method and Amendment 1
pH	
HJ 1147-2020	Water quality—Determination of pH—Electrode method
Smoke	
BM-IC-8333	RINGELMANN Smoke Chart Revision of IC 7718
HJ/T 398-2007	Stationary source emission-Determination of blackness of smoke plumes-Ringelmann smoke chart
Instruções para controlo da poluição por fumos gordurosos e negros e maus cheiros provenientes dos estabelecimentos de restauração e bebidas e estabelecimentos congéneres Translation: Guidelines for the Pollution Control of Cooking Fume, Black Smoke and Odour from Food and Beverage Businesses and Similar Establishments	Item 1.3
Instruções para controlo da poluição por fumos negros e partículas provenientes de fornalhas Translation: Guidelines for the pollution control of black smoke and particulates emitted from furnaces	Item 1
Instruções técnicas para o controlo de poluição proveniente da fábrica de betume Translation in English: Technical Instructions for	Item 5

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the Control of Pollution from the Bitumen Factory	
Regulamento Administrativo n.º 28/2021 Limites de emissão de poluentes atmosféricos das caldeiras dos estabelecimentos industriais e comerciais Translation: Administrative Regulation No. 28/2021 Limits for emission of atmospheric pollutants from boilers in industrial and commercial establishments	ANEXO (a que se refere o artigo 4.º) Limites de emissão de poluentes atmosféricos Translation: Attachment (referred to in article 4) Air pollutant emission limits)
Total Organic Carbon Testing	
HJ 501-2009	Water quality - Determination of total organic carbon -Combustion oxidation nondispersive infrared absorption method
Vibration	
GB/T 6075.6-2002	Mechanical vibration — Evaluation of machine vibration by measurements on non-rotating parts—Part 6: Reciprocating machines with power ratings above 100kW
GB 10070—1988	Standard of environmental vibration in urban area
GB 10071—1988	Measurement method of environmental vibration of urban area
GB/T 2820.9-2002	Reciprocating internal combustion engine driven alternating current generating sets—Part 9: Measurement and evaluation of mechanical vibrations
GB/T 6075.1-2012	Mechanical vibration—Evaluation of machine vibration by measurements on non-rotating parts—Part 1: General guidelines
GB/T 6075.2-2012	Mechanical vibration — Evaluation of machine vibration by measurements on non-rotating parts—Part 2: Land-based steam turbines and generators in excess of 50 MW with normal operating speeds of 1500r/min, 1800r/min, 3000r/min and 3600r/min
GB/T 6075.3-2011	Mechanical vibration — Evaluation of machine vibration by measurements on non-rotating parts—Part 3: Industrial machines with nominal power above 15 kW and nominal speeds between 120 r/min and 15000 r/min when measured in situ

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GB/T 6075.7-2015	Mechanical vibration — Evaluation of machine vibration by measurements on non-rotating parts—Part 7: Rotodynamic pumps for industrial applications, including measurements on rotating shafts
GB/T 50355-2018	Standard of limits and measurement methods of vibration in the room of residential building
HJ 918—2017	Technical specifications for environmental vibration monitoring
ISO 8528-9:2017	Reciprocating internal combustion engine driven alternating current generating sets — Part 9: Measurement and evaluation of mechanical vibrations
ISO 20816-3:2022	Mechanical vibration — Measurement and evaluation of machine vibration — Part 3: Industrial machinery with a power rating above 15 kW and operating speeds between 120 r/min and 30 000 r/min
ISO 10816-6:1995/AMD 1:2015	Mechanical vibration — Evaluation of machine vibration by measurements on non-rotating parts — Part 6: Reciprocating machines with power ratings above 100 kW AMENDMENT 1
ISO 10816-7:2009	Mechanical vibration — Evaluation of machine vibration by measurements on non-rotating parts — Part 7: Rotodynamic pumps for industrial applications, including measurements on rotating shafts
ISO 20816-1:2016	Mechanical vibration — Measurement and evaluation of machine vibration — Part 1: General guidelines
ISO 20816-2:2017	Mechanical vibration — Measurement and evaluation of machine vibration — Part 2: Land-based gas turbines, steam turbines and generators in excess of 40 MW, with fluid-film bearings and rated speeds of 1 500 r/min, 1 800 r/min, 3 000 r/min and 3 600 r/min
Water Quality Sampling	
APHA 4500-NO ₂ ⁻ 24 th edition, 2023	Standard methods for the examination of water and wastewater 4500-NO ₂ ⁻ B (Nitrite)
GB/T 5750.5-2023	Standard examination methods for drinking water - Nonmetal parameters 4.1 (Sulphate)
GB/T 5750.6-2023	Standard examination methods for drinking water - Metal parameters 4.5 (Chromium, Iron, Nickel, Copper, Arsenic, Cadmium, Antimony, Mercury, Lead)
GB/T 5750.6-2023	Standard examination methods for drinking water - Metal parameters 13.1 (Hexavalent chromium)
GB/T 7467-1987	Water quality - Determination of chromium (VI) - 1, 5 Dtphenylcarbohydrazide spectrophotometric method (Hexavalent chromium)
GB/T 19837-2019	Ultraviolet (UV) disinfection equipment for urban water and wastewater engineering 6.2 Appendix B measurement of Ultraviolet Transmittance (UVT) in the water body

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ISO 5667-3:2018	Water quality — Sampling — Part 3: Preservation and handling of water samples
ISO 19458:2006	Water quality — Sampling for microbiological analysis
Solid	
APHA 2540 G 24th Edition 2023	Standard methods for the examination of water and wastewater, 2540 G. Total, Fixed, and Volatile Solids in Solid and Semisolid Samples
CJ/T 221-2023	Standard examination methods for municipal sludge 5.4 moisture content